

access provincial data is underway. The RISC continues to work through the NSIR-RT pilot to mitigate the identified barriers in an effort to improve provincially provided care.

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PREDICTORS OF NODAL RESPONSE AFTER NEOADJUVANT CHEMORADIOOTHERAPY FOR RECTAL ADENOCARCINOMA: A RETROSPECTIVE STUDY

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Purpose: Pathological response to neoadjuvant therapy has been linked to long-term outcome in rectal cancer (RC). Predicting nodal response is important especially in cases where watch and wait strategy is being considered. This study was carried out to identify potential predictors of pathological nodal response after long course chemoradiotherapy (CRT).

Methods and Materials: A retrospective review of all patients with clinically node positive RC who received neoadjuvant CRT in Manitoba between January 2007 and December 2012 was conducted. Pre CRT tumour staging, treatment-related hematologic toxicities and pathologic nodal response data were recorded. Univariable and Multivariable analyses were performed using Bayesian logistic regression models.

Results: Two hundred and six patients with clinically node positive RC were included in this study. The mean number of excised nodes was 16.35. One hundred and seventeen patients (56.8%) achieved a pathologic complete nodal response. Higher pre-treatment carcinoembryonic antigen (CEA) level ($p = 0.0072$) and presence of lymphovascular space invasion (LVI) in the surgical specimen ($p = 0.0002$) were independent predictors of lack of nodal response. In the univariable analysis, there was a tendency to a better response in patients who developed less treatment-induced lymphocytopenia.

Conclusions: Pre-treatment CEA and presence of LVI predicted less pathological nodal response post CRT for rectal cancer. LVI is a pathological finding, however, signs of vascular invasion can be detected on the pre-treatment MRI. These results could potentially be used to identify favourable responders to CRT and guide management strategies of rectal cancer especially when organ and function preservation are pursued.

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STEREOTACTIC BODY RADIOTHERAPY FOR UNRESECTABLE HEPATOCELLULAR CARCINOMA: AN ANALYSIS BASED ON TUMOUR SIZE

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Purpose: Stereotactic body radiotherapy (SBRT) can treat hepatocellular (HCC) patients who are not eligible for surgery, trans-arterial chemoembolization or radiofrequency ablation. This study aims to compare the efficacy and toxicity of SBRT to small tumours (< 4.4 cm, our median population size) and moderate to large tumours (≥ 4.4 cm).

Methods and Materials: A retrospective study of the first 48 provincially treated HCC patients (March 2011-July 2015) was conducted. All patients were discussed at multidisciplinary rounds and considered ineligible for further standard local therapies. Local control (LC), progression free survival (PFS), overall survival (OS) and toxicities were analyzed.

Results: Fifty-one separate hepatomas were treated with a median size of 4.4cm (range: 1.3-15.6cm). Baseline demographics, performance status, previous liver-directed

treatments, and Child's Pugh (CP) score were similar between the groups. Hepatitis B was more common in the ≥ 4.4 cm group while Hepatitis C was more common in the < 4.4 cm group ($p = 0.05$). RT doses were 36 to 50 Gy in three to 10 fractions, with 87% of patients receiving 45 Gy in 3 or 5 fractions. Twenty-eight (55%) hepatomas were treated with a biological equivalent dose (BED10) ≥ 100 Gy and 45 (88.3%) were treated with a BED10 ≥ 80 Gy. Tumours <4.4cm were more likely to be treated with a BED10 ≥ 80 Gy ($p < 0.001$). Seven patients (15%) had worsened CP score by > 1 point at three months post-SBRT, but this was not different between the two groups ($p = 0.86$). LC for all patients was 94% at one and two years, and was comparable for tumours < 4.4 cm and ≥ 4.4 cm (two year LC: 96% for < 4.4 cm versus 92% for ≥ 4.4 cm, $p = 0.91$). OS for all patients was 65% at two years (87% for < 4.4 cm versus 46% for ≥ 4.4 cm, $p = 0.07$). PFS was 38% at two years for all patients, and did not differ significantly between groups ($p = 0.70$). On univariate analysis, BED10 ≥ 80 Gy was the only factor associated with improved PFS, while both BED10 ≥ 80 Gy and normal baseline AFP were associated with improved OS.

Conclusions: SBRT provides high local control for patients with inoperable HCC and can be delivered with acceptable risk for post-treatment hepatic injury even for moderate to large sized tumours. Radiation doses above BED10 of 80 Gy improved PFS and OS in our cohort.

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CHEMORADIOOTHERAPY FOR ANAL CANCER: ANALYSIS OF TWO RADIOTHERAPY TECHNIQUES AND CHEMOTHERAPY REGIMENS

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Purpose: Concurrent chemoradiation (CRT) with fluorouracil (5-FU) and mitomycin C (MMC) is standard treatment for anal canal carcinoma (ACC). However, treatment varies based on available RT technology and centre preference for chemotherapy (CT) regimen. The purpose of this study was to compare dosimetric parameters, toxicity, and outcomes in ACC patients treated with two different RT modalities and CT regimens.

Methods and Materials: This is a retrospective study of consecutive ACC patients treated with radical CRT at two tertiary cancer centres from 2008-2012. Patients were grouped according to RT modality (IMRT versus HT), and CT regimen (5-FU with: one cycle MMC, MMC1 versus two cycles, MMC2). Primary endpoints were dosimetric comparison between the RT cohorts and toxicity comparison between the CT cohorts; secondary endpoint was comparison of outcomes, including patterns of failure, disease-free survival (DFS), overall survival (OS), colostomy-free survival (CFS).

Results: Of 64 patients in total, 34 (53%) were treated with IMRT and 30 (47%) with HT. Patient and tumour characteristics were not significantly different between the groups. Twenty-six patients (43%) received MMC1, while 34 (57%) patients received MMC2; 4 patients received 5FU/cisplatin. The majority (25/34, 74%) of IMRT patients received MMC1, while most HT patients (29/30, 97%) received MMC2 ($p < 0.01$), which correlated with treatment centre. HT achieved more homogenous coverage of the primary tumour (HT homogeneity and uniformity index 0.15 and 1.03 versus 0.29 and 1.06 for IMRT, $p < 0.01$ and $p < 0.01$). IMRT achieved better bladder, femoral head and peritoneal space sparing, and lower skin dose ($p < 0.01$ for all). HT achieved lower bone marrow and external genitalia dose (both $p < 0.01$) versus IMRT. Comparing CT regimens, MMC2 was more strongly associated with Grade 2+ neutropenia ($p = 0.03$) and Grade 4 toxicity ($p = 0.03$) versus MMC1. There were no differences in local, regional or distant failure based on RT modality ($p = 0.46$, $p = 0.62$, $p = 0.12$, respectively) or CT regimen ($p = 1.0$, $p = 0.31$, $p = 0.16$). Additionally, there were no differences in OS, DFS or